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### ABSTRACTS OF ARTICLES FROM UNAVAILABLE SOVIET SCIENTIFIC AND TECHNICAL PERIODICALS (5)

[Comment: This report presents abstracts taken from issues of the Soviet periodical Referativnyy Zhurnal published May-August 1954. These abstracts are of articles originally published in Soviet scientific and technical serial publications which are not known to be available outside the Soviet Orbit.

The following form is used for each abstract in this report:

General subject, specific subject (Soviet abstract number) Name of unavailable periodical, volume and/or issue number, date, pages Author of article Title of article (Language, if other than Russian) Abridgment of abstract (Source)

The sources, indicated in parentheses at the end of each abstract, are abbreviated as follows:

RZhAstr Moscow, Referativnyy Zhurnal -- Astronomiya i Geodeziya 4 RZhFiz Moscow, Referativnyy Zhurnal -- Fizika! Moscow, Referativnyy Zhurnal -- Khimiya >> Moscow, Referativnyy Zhurnal -- Matematika 9 Moscow, Referativnyy Zhurnal -- Mekhanika] >> RZhKhim RZhMat

### I. ASTRONOMY

Astrometry, Ephemerides (4478) Byull. Inst. Teoreticheskoy Astronomii AN SSSR [Vol] 5, No 8, 1953, pp 546-559 Zagrebin, D. V.

The Obtaining of Lunar Ephemerides by Analytic Computation Machines

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Method used in the above institute facilitating the mechanication of computation of lunar ephemerides is described. Data from Braun's tables are transferred on cards, allowing the compilation of functions for each calendar year by mechanical means. (RZhAstr, No 8, 1954)

Geodesy, Aerial Photography (4669)
Sbornik Statey po Geodezii, No 4, 1953, pp 37-42
Bychkovskiy, K. P.
Determination of the Inclination Angle of Aerial Pictures and of the Airplane
From Readings of the Statoscope

The inclination of the airplane is computed from readings of a statoscope recorder indicating the differences in altitude of the photographic base. Photogrammetric measurements of elements of mutual orientation give the angles of transversal picture inclinations. (RZhAstr, No 8, 1954)

Geodesy, Terrestrial Ellipsoid (4682) Sbornik Statey po Kartografii, 1953, pp 35-44 Taich, V. D. Application of Perspective Projects for Small-Scale Maps

Criticizes transformation method of maps in perspective using computation of coordinates of nodal points, condensation of network, and drawing along squares. Suggests a graphical transformation of nets. (RZhAstr, No 8, 1954)

Theoretical Astrophysics, Nonstationary Stars (4519)
Publikatsii Tartuskoy Astron. Observatorii, [Vol] 32, No 5, 1953, pp 281-326
Kipper, A. Ya.
Origin of Stellar Magnetic Fields

Using Dirac's equation in a slightly bent Riemann's space, the author attempts to prove that an electron of specified energy moves as if it were in a plane space and in an electromagnetic field, of which he derives the equation. (RZhAstr, No 8, 1954)

# II. CHEMISTRY

Biological Chemistry, Biochemistry of Microbes (18392)

Dokl. VASKhNIL, No 8, 1953, pp 21-25

Polonskaya, M. S.; Leonovich, V. V.; Biberdiyeva, M. P.

Concentrate of Bacteriostatic Substances From Acidophilic Bacteria

Established that both liquid and dry concentrates suppress the growth of Bact. coli, paratyphoid bacteria A and B, Bact. dysenteriae Flexner, and other gram-positive and gram-negative microorganisms. (RZhKhim, No 5, 1954)

Biological Chemistry, Biochemistry of Plants (18283)

Lzv. AN Arm. SSR, Biol. i s.-kh Nauki, Vol 6, No 8, 1953, pp 81-86

Melkumyan, I. S.

Tannin Content in Armenian Oaks

Investigated the total tannin content in three species of oak: Quercus macranthera F. et M, Q. iberica Stev., and Q. araxina A. Grossh. (RZhKhim, No 5, 1954)

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Ceramics, Glazes (20557)

Soobshcheniya AN Gruz. SSR, Vol 14, No 6, 1953, pp 337-334

Pitskhelauri, A. I.

Studying the Properties of Volcanic Tuffs With the Aim of Using Them in Production of Glazed Decorative Stoves

When Georgian tuffs are fired at temperatures over 900 degrees centigrade, the mechanical stability is increased. When used as a glaze on stoves, it resembles marble. (RZhKhim, 6, 1954)

Hydrochemistry (19738)
Gidrokhim. Materialy, Vol 20, 1953, pp 46-48
Golovkov, M. P.
Hydrochemistry of Natural Ices

Investigation of ices from different sources revealed differences in structure and physical properties. These differences are due primarily to the differences in the chemism of the waters in which the ices were formed. (RZhKnim,  $\delta$ , 1954)

Hydrochemistry (19740) Gidrokhim. Materialy, Vol 20, 1953, pp 29-34 Klyuyevskiy, F. M. Conditions for the Rational Exploitation of Ponds

In order to increase the circulation and thus improve the quality of water in ponds, it is suggested that a drain be installed at the bottom during the spring of the year. (RZhKhim, 6, 1954)

Inorganic Analysis (20355)
Gidrokhim. Materialy, Vol 21, 1953, pp 114-120
Lazarev, K. G.
Determination of Calcium in Solutions of MgCl, and MgSOh

Describes the determination of small quantities of calcium using three methods: (1) the conventional oxalate method, (2) preliminary separation of calcium by adding dry ammonium oxalate, and (3) the alcoholic method (sulfate-oxalate method). (RZhKhim, 6, 1954)

Inorganic Chemistry, Complex Compounds (17924)

Izv. AN Latv. SSR, No 3, 1953, pp 123-131

Keshan, A.; Bimba, S.

Cobalt Hexaborate

When cobalt acetate is treated with an excess of boric acid, cobalt hexaborate is obtained, which is in the form of the octahydrate when cold. It loses its water of hydration at various temperatures becoming the anhydrous salt at 665-690 degrees centigrade. (RANKhim, No 5, 1954)

Inorganic Chemistry, Complex Compounds (17934)
Soobshch. o Nauch. Rabotakh Vses. Khim. Ob-va im. Mendeleyeva, No 1, 1953, pp 18-23
Turkevich, N. M.
Polymeric Bismuth Compounds

Studied the polymeric structure of acetyldibismuth tartrate and of bismuth acetylnitrotartrate, and gives their structural formulas. (RzhKhim, No 5, 1954)

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Organic Chemistry, General (17969)
Soobshch. o Nauch. Rabotakh Vses. Khim. Ob-va im. Mendeleyeva, No 1, 1953, pp 46-49
Tronov, B. V.; Kolesnikova, S. F.
Effect of Complex Formation on the Iodination Velocity of Phenol and Aniline

Studied the iodination of phenol and aniline in benzene and alcohol solutions in the presence of pyridine, nitrobenzene, hydrochloric acid, potassium fluoride, and sodium iodide. (RZhKhim, No 5, 1954)

Organic Chemistry, Naturally Occurring Substances (18097)

<u>Dokl. AN Azerb. SSR</u>, Vol 9, No 5, 1953, pp 279-282

<u>Satter-Zade, I. S.</u>

Studying the Optical Activity During the Conversion of Limonine Through the Action of Active Clays

At 25-50 degrees the optical activity of limonine is not changed. At 100 degrees, the angle of rotation is increased by 1.25 degrees; at 150 degrees, complete recemization takes place. (RZhKhim, No 5, 1954)

Physical Chemistry (19593)

Dokl. AN Urb. SSR, No 7, 1953, pp 29-31

Talipov, Sh. T.; Obel'chenko, P. F.

Solubility of Some Difficult-to-Dissolve Silver Salts in Solutions of Electrolytes.

Systems: (1) Ag<sub>3</sub>PO<sub>4</sub>-Na<sub>2</sub>SO<sub>4</sub>-H<sub>2</sub>O and (2) Ag<sub>3</sub>PO<sub>4</sub>-K<sub>2</sub>SO<sub>4</sub>-H<sub>2</sub>O at 25°

Determined the solubility of silver phosphate in solutions of sodium and potassium sulfate for the concentration range from 10<sup>-5</sup> molar to saturation at 25 degrees. As the concentration of sodium or potassium sulfate is increased, the solubility of the silver phosphate increases. (RZhKhim, No 6, 1954)

Physical Chemistry, Catalysis (17822)

Izv. AN Kaz. SSR, ser. khim., No 5, 1953, pp 34-38
Shcheglov, N. I.; Sokol'skiy, D. V.

Hydrogenation of Methylpropylvinylcarbinol

Describes hydrogenation of methylpropylvinylcarbinol over a platinum catalyst. As concentration of platinum increases from 0 to 0.87%, the activation energy increases from 7 to 11 kiloculories where it remains constant with further additions of platinum. (RZhKhim, No 5, 1954)

Studied the solubility of silver phosphate in the above aqueous solutions at 25 degrees. The concentration of the salts was varied from  $10^{-5}$  molar to saturation. (RZhKhim, No 5, 1954)

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III. MATHEMATICS

General Questions (3927) Izv. AN Uzb. SSR, No 6, 1953, pp 102-105 Arzhanykh, I. S. Development of Mathematics and Mechanics in Uzbekistan

Lists the achievements in mathematical analysis and mechanics of the Institute of Mathematics and Mechanics, Academy of Sciences Uzbek SSR. Discusses the program planned for the future. (RZhMat, No 7, 1954)

History of Mathematics (3936) Izv. AN Uzb. SSR, No 6, 1953, pp 3-8 Zakhidov, T. Z. Ten Years of the Academy of Sciences of the Uzbek SSR

[No abstract given.] (RZhMat, No 7, 1954)

Numerical and Graphical Methods (4196) Byulleten' Instituta Teor. Astronomii AN SSSR, Vol 5, No 8, 1953, pp 512-545 Mechanization of Astronomical Calculations

Describes briefly the calculating aids in use at the Institute of Theoretical Astronomy of the Academy of Sciences of the USSR. Gives an example to show how the machines perform a difficult computation. (RZhMat,

Numerical and Graphical Methods (4584) Inzh. sbornik In-ta mekhaniki AN SSSR, Vol 15, 1953, pp 207-215 Graphical Solution of Integral Equations

Describes the graphical solution of integral equations and give spatial illustrations. The method is based on the geometric interpretation of an integral depending on a variable parameter and on the method of successive

Numerical and Graphical Methods (4587) Sbornik stud. nauch.-issled. rabot Belorusskoy s.-kh. akad., No 1, 1953, Vyal', M. Solution of Normal Equations by the Method of Successive Approximations

Discusses cases in which the method of successive approximations is

superior to any other for the solution of normal equations. The article contains little which is original, since these conclusions have been known

Numerical and Graphical Methods (4919) Dokl. AN Uzb. SSR, No 10, 1953, pp 6-9 Leyderman, Yu. R. Solution of a System of Linear Algebraic Equations by the Method of Successive

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Increases the precision of L. A. Lyusternik's procedure for improving the convergence of the iteration method in the solution of a system of linear equacigenvalues of the matrix A. The article is marred by careless writing and misprints. (RZhMat, No 9, 1954)

Numerical and Graphical Methods (4920)
Sbornik Statey po geodezii, No 4, 1953, pp 69-83
Uspenskiy, A. K.
Solving Error Equations by the Method of the Least Limiting Deviation

When the method of least squares is used to determine the most probable values of unknown x's from a system of incompatible error equations of the form  $v_1 = a_1x_1 + b_1x_2 + \cdots + b_1x_k + b_1$  (i = 1, 2, . . . , n), the calculations become prohibitive. The author therefore suggests a different method, based on the least limiting deviation. He asserts that the values obtained through the use of his method are sufficiently close to the values obtained when least squares are employed. The articles contains inaccuracies and a few faulty proofs. (RZhMat, No 9, 1954)

Numerical and Graphical Methods (4921)
Vychisl. matem. i vychisl. tekhnika (In-t tochn. mekhan. i vychisl. tekh. AN SSSR),
No 1, 1953, pp 3-13
Ditkin, V. A.; Lyusternik, L. A.
Method of Practical Harmonic Analysis on a Sphere

A formula derived earlier by the authors (Dokl. An SSSR, Vol 61, No 3, 1948, pp 441-444) is used in the approximate determination of the coefficients of the first five harmonics in the expansion of an arbitrary function, given on a sphere, in a series of spherical functions. The authors assert that this method is easier than the one in general use. (RZhMat, No 9, 1954)

Numerical and Graphical Methods (4922)

Izv. Leningr. elektrotekhn. in-ta, No 25, 1953, pp 28-39

Lebedev, A. N.

Theory of the Automatization of the Solution of a System of Two Algebraic Equations

Discusses the automatization of the solution of a system of equations  $f_1(z_1, z_2) = 0$ ,  $f_2(z_1, z_2) = 0$ . One device chooses quantities  $k_1$  and  $k_2$ , and another device measures  $f_1(k_1, k_2)$  and  $f_2(k_1, k_2)$ . Derives conditions for stability and for the algebraic qualities of the system. (RZhMat, No 9, 1954)

Probability Theory (4095)
Voyennyy vestnik, No 2, 1954, pp 64-68
Buslenko, N.
Elementary Exposition of the Basic Concepts of Probability Theory

[No abstract given.] (RZhMat, No 7, 1954)

Probability Theory (4102)

<u>Dokl. AN Uzb. SSR</u>, No 7, 1953, pp 5-9

<u>Manevich, D. V.</u>

<u>Local Limit Theorem for Homogeneous Markov Chains</u>

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A proof of a necessary and sufficient condition that an expression derived from a homogeneous Markov chain approach zero as the length of the chain increases indefinitely is sought. Such proof is based on a lemma which can be refuted by a simple example. An example can be constructed which will show that the theorem itself is untrue, hence the whole work must be regarded as erroneous. (RZhMat, No 7, 1954)

Probability Theory, Mathematical Statistics (4518) Soobshch. AN Gruz. SSR, Vol 14, No 9, 1953, pp 521-524 Maniya, G. M.

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Applying the Estimate of the Maximum of Bilateral Deviations of an Empirical Distribution Curve in a Fixed Interval of Growth of the Theoretical Law

Presents tables for the statistical analysis of an empirical distribution function  $S_n$  (x) which is constructed from n independent observations of a random quantity with a continuous distribution function F(x). (RZhMat, No 8, 1954)

Theory of Numbers (3958)
Soobshch. AN Gruz. SSSR, Vol 14, No 9, 1953, pp. 513-520
Lursmanshvill, A. P.
Number of Whole Points in a Multidimensional Sphere of Odd Dimensionality

Sets up and proves an asymptotic formula for the difference  $A_k(x) - V_k(x)$ , where for x greater than one,  $A_k(x)$  represents the number of whole points in the k-dimensional sphere  $z_1^2$   $z_2^2$  . . .  $z_k^2 \leq x$ , and  $V_k(x)$  is the volume of the sphere. Earlier articles by various authors had presented similar but more simple results for spheres of even dimensionality and the effect of the present article is to generalize the discussion to include all spheres. (RZhMat, No 7, 1954)

# IV. MECHANICS

General Mechanics, Fundamentals of Mechanics (3944)

<u>Doklady Akademii Nauk Uzbek SSR</u>, No 3, 1953, pp 8-12

Shul'gin, M. F.

Theorem on the Properties of the Integrals of a System of Differential Equations

Analogous to the Classical Theorem of Poisson

A system of second-order equations in the well-known transformation of Liouville is brought to a system of canonical form with a greater number of variables. The theorem of Poisson is applied to the obtained system. (RZhMekh, No 7, 1954)

Hydromechanics, Hydrodynamics, and Hydraulics (4067)

Doklady Akademii Nauk, Azerbaydzhan SSR, [Vol] 9, No 5, 1953, pp 259-264

Yes'man, V. I.

Processes of Intake and Compression in a Multicylinder Crankless Pump

The multicylinder crankless pump has the following advantages over a multicylinder piston pump: (1) decreases the effect of inertial thrust on the pressure in the cylinder during intake and compression; and (2) lowers the maximum values of accelerations of the piston. (RZhMekh, No 7, 1954)

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Hydromechanics, Hydrodynamics, and Hydraulics (4073)

Doklady Akademii Nauk Azerbaydzhan SSR, [Vol] 10, No 2, 1954, pp 87-93

Ibad-Zade, Yu. A.

Hydraulic Elements of Currents in Natural Waterways

Certain geometric characteristics of sections of similar form are discussed. A comparison of actual observations of natural waterways with his own formulas and the formulas of Rene Koehchlin, is presented. (RZhMekh, No 7, 1954)

# V. PHYSICS

Atomic and Molecular Physics, Thermodynamics (7394)

Byull. Polskoy Akad. Nauk., Otd III, [Vol] 1, No 1-2, 1953, pp 66-69

Swietoslawski, W.

Method of Determining the Composition and the Boiling Point of Three Constituent
Positive-Negative Azeotopes XVI

A method of determining the boiling point of a triple positive-negative azetope is described. Curves of boiling points of various mixtures are plotted. The composition and the boiling point of a triple azeotope is found by graphic interpolation. (RZhFiz, No 7, 1954)

Atomic and Molecular Physics, Thermodynamics (7395)
Byull. Polskoy Akad. Nauk., Otd. III, [Vol] 1, No 1-2, 1953, pp 60-61
Swietoslawski, W.
Classification of Negative Azeotopes XIV

A classification of dehydrated azeotopes is based on behavior of forces interacting among the liquid particles, i.e. the forces of Van der Waals, of chemical affinity, and of electrochemical attraction (RZhFiz, No 7, 1954)

Atomic and Molecular Physics, Thermodynamics (7396)

Byull. Polskoy Akad. Nauk., Otd. III, [Vol] 1, No 1-2, 1953, pp 62-65

Swietoslawski, W

On Three-Constituent Positive-Negative Azeotopes XV

The position of the point representing the constitution of a triple positive-negative azeotope in coordinates of Gibbs triangle should depend on the classification group to which the double negative azeotope belongs (See Referativnyy Zhurnal -- Fizika, 1954, Abstract 7395). (RZnFiz, No 7,

Optics, Physical Optics (7972)
Sbornik Statey po Obshchey Khimii, [No] 1, 1953, pp 275-277
Razuvayev, G. A.; Oldekop, Yu. A.
Photoreactions of Metallo-Organic Compounds of Mercury in Solutions XII,
Photoreactions of Diphenyl Mercury and bis-n-chlorophenyl Mercury

A photolysis of  $(c_6H_5)_2Hg$  (I) was processed in a number of substances for confirming the reactive formation of benzol on account of the interaction of the radical  $c_6H_5$  with the solvent. Various reactions are described. (RZhFiz, No 7, 1954)

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Optics, Physiological Optics (8101)

Problemy Fiziologicheskiy Optiki, [No] 8, 1953, pp 302-306

Boldyrev, N. G.

Experimental Confirmation of Energetic Theory of Sight

Energetic theory of sight is based on the assumption of simple energetic correlations in the complex process of seeing. Some formulas are derived. (RZhFiz, No 7, 1954)

Optics, Physiological Optics (8102)
Problemy Fiziologicheskiy Optiki, [No] 8, 1953, pp 336-340
Shvarts, Z. M.
Dependence of Sharpness of Depth Perception on the Contrast Difference of the Objects With the Background

Establishment of the effect of contrasts of two objects on the perception of depth is attempted. This effect proved to be different with various observers. (RZhFiz, No 7, 1954)

Solid State Physics, Crystallization Processes (8909)
Voprosy Petrografii i Mineralogii, Vol 2, 1953, pp 411-420
Nikolayev, V. A.
Some Information on the Derivation of I. F. Shrader's Equation and Its Application to Silicate Systems

Reviews Schrader's (1890) and Van Laar's (1904) equations and finds a discrepancy of 3-8% between theory and experience. (RZhFiz, No 8, 1954)

Solid State Physics, Structure of Deformed Metals (7519)
Voprosy Fiz. Metallov i Metallovedniya AN Ukrainskoy SSR, No 4, 1953, pp 12-21
Lysak, L. I.; Nesterenko, Ye. G.
Change of Fine Crystalline Structure and Softening of Stamped Steels During
Tempering

Method of treatment of steel specimens is described. The fine crystalline structure was studied from (110) and (220) lines of iron emission. Concludes that carbides pass one into another not by structural transitions but by consecutive dissolution and separation. (RZhFiz, No 7, 1954)

Solid State Physics, Thermal Properties of Solid Bodies (8908)

Voprosy Fiziki Metallov i Metallovedeniya AN Ukrainskoy SSR, No 4, 1953, pp 42-48

Dekhtyar, I. Ya.

Problem of Dependence of Coefficient of Diffusion on Interatomic Action in Metals

and Alloys

Analyzes the equation relating the diffusion coefficient to the temperature. Concludes that the diffusion parameters depend on the interatomic interaction and therefore on the behavior and the values of interatomic bonds in metals and alloys. (RZhFiz, No 8, 1954)



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Theoretical Physics, Quantum Electrodynamics (6911)

Byull. Polskoy Akad. Nauk, Otd. III, No 1-2, 1953, pp 18-21

Application of the control of the control

Application of the Approximation Method to Dirac's Electrodynamics

A method of approximate solution of Dirac's equations of electrodynamics (Dirac P. A. M., Proc. Roy. Soc., 1952, A209, 291; A212, 330), analoguous to that of the gravity and of the meson theories (RZhFiz, 1954, 6922) is presented, taking into account some assumptions. The determination of the field yields simultaneously the equations of the motion of particles. (RZhFiz, No 7, 1954)

Theoretical Physics, Quantum Field (6922)

Byull. Polskoy Akad. Nauk, Otd. III, No 1-2, 1953, pp 22-25

Verle, Ya.

New Approximation Method for Meson Fields

A new method for the solution of meson field equations is suggested. It is a generalized solution of electrodynamics and gravity theory equations with introduction of approximate lagging (See V. A. Fok, <u>ZhETF</u> 9, 375 (1939); see also <u>RZhFiz</u> 1954-2267). (RZhFiz, No 7, 1954)

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